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SWA & SWS
Installation & Operation Manual
ATEX - IECEx

The information in this manual is intended to assist with equipment design and ensure proper installation.

READ THIS INSTRUCTION FIRST

To avoid serious or fatal personal injury or major property damage, read and follow all safety instruction in this manual. If you require additional assistance, please contact SOLEXY.

SAFETY INSTRUCTION TO HAZARDOUS AREA INSTALLATION

- It is the responsibility of the installer and the end-user to ensure that the Solexy WA/WS enclosures are installed and maintained according to the suitable standards for electrical application in potentially explosive atmospheres (example IEC/EN 60079-14, IEC/EN60079-17) and any other relevant electrical code.
- Suitably trained personnel shall carry out installation according with applicable code practice.
- Read this first and keep this instruction manual always available.

MARKING

SWA and SWS unit:

Ex I M2 Ex db I Mb (SWS only)
II 2G Ex db IIA/IIB/IIC (1) T6…T4 Gb
II 2D Ex tb IIIC T110°C…T140°C Db

SWA and SWS unit complete of Solexy RX or SX antenna barriers:

Ex I M2(M1) Ex db mb [ia Ma] I Mb (SWS only)
II 2(1)G Ex db mb [ia Ga] IIA/IIB/IIC (1) T6…T5 Gb
II 2(1)D Ex tb IIIC T80°C…T100°C Db

(1) Refer to product marking for gas group details

This instruction refers to certified equipment covered by following certificate:

ATEX: FIDI 20 ATEX 0014
IECEx: IECEx EXA 14.0001

WARNINGS

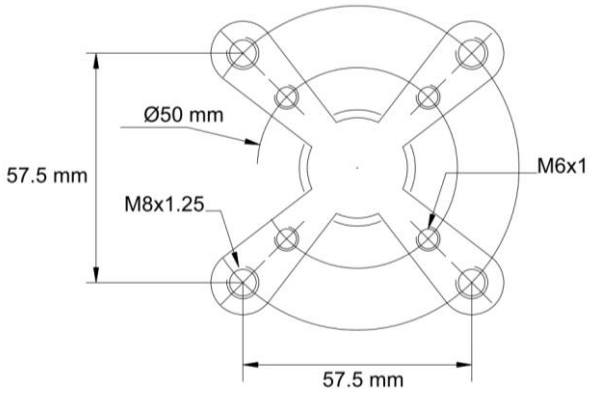
- Warns of hazard that MAY cause serious personal injury, death or major property damage.
- DISCONNECT THE EQUIPMENT FROM THE SUPPLY CIRCUIT BEFORE OPENING. KEEP ASSEMBLY TIGHTLY CLOSED WHEN IN OPERATION.
- DISCONNECT ALL POWER BEFORE SERVICING EQUIPMENT.
- HAZARDOUS VOLTAGE
- DO NOT REMOVE COVER WHEN ENERGISED.
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.

NOTES

- To avoid the thread cover blocking the thread joint can be protected with greases like Nyogel 760G, Uniflor 8512R, Uniflor 8911 or equivalent compatible with Silicone (VMQ) and Fluorosilicone (FVMQ) gasket.
- The user should not repair this equipment.
- The flameproof joints are not intended to be repaired.
- The user should not modify the unit.
- The unit should not be painted by the user.
- If the equipment is likely to come in to contact with aggressive substances, it is responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised. Aggressive substances: example Acids, liquids, gases with can affected metals.
- The metallic alloy used for the enclosure, in the event of a rare accident, could cause ignition sources due to impact or friction (sparks may occur). This shall be considered when the box is installed in group Ex area.
- Remove plastic plugs or plastic stickers supplied with enclosure before installation. The conduit plugs supplied are for transit purposes only, these components aren't certified.
- Weatherproof levels depend on cable gland and cabling methods used.
- For functionality of device installed inside the enclosure refer to the device's instruction.
- Use only cable glands and plugs that are suitable for the type of protection and maintain the enclosure's environmental protection rating.
- Any unused entries must be filled with appropriate equipment (i.e. plugs) that are suitable for the type of protection and maintain the enclosure's environmental protection rating.

INSTALLATION

1. The unit can be installed in all position.
2. Fix the unit using n° 4 M6x10 or M8x10 bolts



GROUNDING

1. Grounding needs to make according to suitable standards for electrical application in potentially explosive atmospheres and/or other national standards.
2. The electrical devices must be grounded using their internal and external M4 grounding connections.

ELECTRICAL WIRING

1. Remove screw cover, remove protection plugs from cable entries and substitute them with cable glands or conduits or plugs suitable for the type of protection required.
2. Connect terminal strip and/or connector according to device's instruction manual.
3. Check that thread joint were free of foreign matters and deformations check the seal is properly fitted in the slot.
4. Reassemble screw cover and lock it by means of the screw or anti-rotation kit.
5. The cover must be screwed and securely locked to the body.

OPERATION

Refer to the device's instruction manual for set-up and functionality

PRODUCT'S STORAGE

Keep the boxes away from atmospheric agents

MAINTENANCE

- The verification and maintenance of the electrical equipment must be performed according to suitable standards for electrical application in potentially explosive atmospheres and/or other national standards.
- The user should guarantee the keeping of the safety characteristic of the device after maintenance.
- The cover must be securely locked to the body.
- After every opening must check before closing that he thread joint is free of foreign matters and deformations and if necessary lubricate the thread joint in order to avoid cover blocking with greases like Nyogel 760G, Uniflor 8512R, Uniflor 8911 compatible with silicone or fluorosilicone gasket or equivalent according to enclosure temperature range.
- In order to guarantee the weatherproof level, it's necessary that the gasket needs to be in good conditions and it shall be verified after every opening. In case of gasket's damage replace with Solexy spare part.
- The maintenance related to the components used for wiring must be performed according to manufacturer instruction.

DISPOSAL / RECYCLING

Disposal and recycling of the product according to national regulation for waste disposal and recycling.
WARNING: Do not dispose of the product and the components in the environment.

MODEL NOMENCLATURE

X	**XX**	**XXX**	**XX**	**-**	**XX**	**X**	**XX**	**-**	**XXXXX**
1	**2**	**3**	**4**	**-**	**5**	**6**	**7**	**-**	**8**

1 *Family*
S Enclosure supply with the electronic device

2 *Series*
WA aluminum enclosure
WS stainless steel enclosure

3 *Device*
XXX 1 digit for device type installed
2 digit for device version

4 *Antenna barrier*
XX 2 digit for Solexy Antenna Barrier if used (optional components)
00 for unit without Solexy Antenna Barrier

5 *Cable entries*
XX 2 digits for cable entries combination

6 *Color - Brand*
X 1 digit for housing's color and/or brand

7 *Certification Mark*
X0 Atex and IECEx (group II)
M0 Atex and IECEx (group I and group II)
X* Atex and IECEx (group II) + a second standard marking
M* Atex and IECEx (group I and group II) + a second standard marking

8 *Special execution*
XXXXX various, consult Solexy

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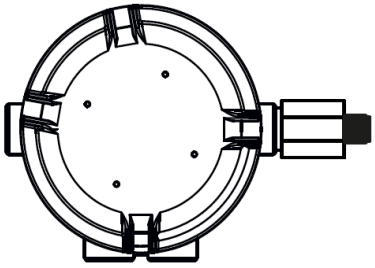
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DESCRIPTION

The SWA & SWS 5x2 is a radiomodem in VHF or UHF that allow to send data via radio waves.

Device version	Model	Antenna Port
512	Radiomodem D510-2	n° 1
542	Radiomodem D540-2	n° 1

5x2



Layout 2

POWER SUPPLY

Screw terminals = Supply voltage: 9-32 VDC
Max Power Consumption 410mA@12VDC

AMBIENT TEMPERATURE RANGE AND SURFACE TEMPERATURE

	Min. ambient temperature	Max ambient temperature	Max surface temperature	T Class
SWA5	-30°C	+63°C	+70°C	Gas = T6 Dust = T80°C
SWS5	-30°C	+57°C	+70°C	Gas = T6 Dust = T80°C

The unit can be reach a surface temperature of 70°C, use cable and cable glands / conduit Ex certified suitable for this temperature.

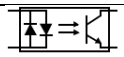
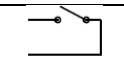
WIRING



JP4 – RS232/485 connection

Pin	Label	Description
1	A RS485	RS-485 (line A +)
2	RXD (OUT)	Data output
3	TXD (IN)	Data input
4	DTR	Data Terminal Ready
5	GROUND	Ground (GND)
6	N.C.	Not connected
7	RTS	Request To Send
8	CTS	Clear To Send
9	B RS485	RS485 (line B -)

JP1 – Power / IO connection

Pin	Label	Description
1		Opto-isolated digital input
2		
3		Digital output normally open (NO)
4		
5	GND	Ground
6	9-32Vdc	Power supply (9-32Vdc)

Step 1 – ANTENNA CONNECTION
Connect the antenna before to turn on the device.

WARNING : use antenna only with 50Ω impedance and with operating frequency in according to technical data listed into the above paragraph "RF information".
The device must be set according to limitation listed at paragraph MAXIMUM PERMITTED RF THRESHOLD POWER (Pth) for installation in Hazardous Location and the national regulation rules.

Step 2 – DATA CABLE CONNECTION
Connect the serial cable to JP4 connector.

Step 3 – POWER SUPPLY CONNECTION

WARNING : DO NOT WIRED POWER SUPPLY WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
FOR SAFETY REASONS WIRING MUST BE MADE ACCORDING TO WA & WS INSTALLATION AND OPERATION MANUAL IM0009

The device can be powered by terminal strip (JP1 pin 5 and 6 with 9-32 VDC).

TROUBLESHOOTING AND LED DEFINITION

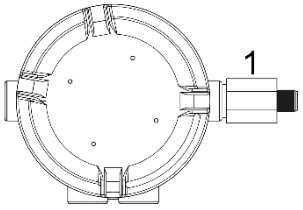
LED definition

- **LD1:** Green -> power ON; Orange fixed -> configuration mode; Orange impulsive -> data received/transmitted on serial port
- **LD2:** Red -> transmission of the data on air

The LED indicator doesn't turn ON

- Verify the power supply (voltage, cabling)

ANTENNA LAYOUT

Device version	Model		
5x203	Radiomodem		Antenna 1 Radiomodem

RF INFORMATION

Device version	
512	Radio Frequency range: 169.4 – 169.475 MHz Radio output power: +26.9 dBm Receiving Sensitivity: -105 dBm ± 3 dBm
542	Radio Frequency range: 868.0 – 870 MHz Radio output power: +26.9 dBm Receiving Sensitivity: -105 dBm ± 3 dBm

Device version	Solexy Antenna	Antenna Gain
512	N° 1 ANB12	3 dBi
	N° 1 ANB15	7 dBi
542	N° 1 ANH43	3 dBi
	N° 1 ANF42	2 dBi
	N° 1 ANB42	11.5 dBi

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MAXIMUM PERMITTED RF THRESHOLD POWER (Pth)

The RF threshold power (Pth), sometimes called the effective isotropic radiated power (EIRP), as defined in IEC/EN 60079-0, is the product of the effective output power of the transmitter multiplied by the antenna gain. The maximum threshold powers for each equipment group as defined by Table 4 in IEC/EN 60079-0 are provided below.

Because most antennas list the gain relative to an isotropic radiator (dBi) instead of the raw power gain, it is often easier to simply add the antenna gain in dBi to the radio output power in decibel-milliwatts (dBm). Any added cable loss between the RF output and the antenna may also be factored in.

$$\text{Pth}_{(dBm)} = \text{RF output power}_{(dBm)} + \text{Antenna gain}_{(dBi)} - \text{Coax cable loss between RF output and Antenna}_{(dB)}$$

The resulting threshold power calculated by the above formula MUST be below the threshold power for the operating area group rating below.

Equipment for	Threshold Power (W)	Threshold Power (dBm)
Group I	6	37.7
Group IIA	6	37.7
Group IIB	3.5	35.4
Group IIC	2	33.0
Group III	6	37.7

The above threshold level refer to installation in classified area Ex according to IEC/EN 60079-0 standard.
The use of device differs from one region and/or country to another. The user of the device must take care that the device is operated only according to local rules and standard or without the permission of the local authorities on frequencies other than those specifically reserved and intended for use without a specific permit. More detailed information is available at the local frequency management authority.

MAXIMUM JOULES CALCULATION IN CASE OF COAX CABLE INSTALLATION

In case of use of a coax cable installation for antenna installation the adding cable need to be evaluating to ensure that the maximum energy stored on cable not exceeded the value allowable per IEC/EN 60079-11:

Max energy (Joules) allowed per IEC/EN 60079-11	
Group I	1500 µJ
Group IIA	950 µJ
Group IIB	250 µJ
Group IIC	50 µJ

The calculation can be done according to following equation:

$$E = \frac{1}{2} * \left\{ (C_1 + C_2) * \left[\left(1.5 * (\sqrt{R * P}) \right) \right]^2 \right\}$$

Where:
E = Energy
C_1 = Antenna Barrier Capacitance (18 pF)
C_2 = Coax cable capacitance
R = Impedance (50Ω)
P = RF power output (26.9 dBm, 500 mW)
1.5 = Safety Factor

Example:

Antenna cable capacitance = 1195 pF

$$E = \frac{1}{2} * \{(18pF + 1195pF) * 56.25\} = 0{,}034\mu J$$

Answer = 0,034 µJ acceptable for any Group